Validating Modeling & Experimental Methods to Enable Drug Discovery

April 19th-21st 2006
National Institute of Standards and Technology (NIST)
100 Bureau Drive
Gaithersburg, MD 20899

To register please see: http://www.nist.gov/public_affairs/confpage/060419.htm

Workshop Agenda

April 19th Evaluation of Computational & Experimental Methods

Breakfast 8.15-8.45AM

Morning-Experimental Session (8.45-12.00 noon)

- Workshop shop aims and objectives
  - Experimental difficulties of measuring small molecule/protein binding
  - The need for accurate protein/ligand binding data
  - State-of-the art experimental measurement of binding interactions

Lunch 12.00-1.00PM

Afternoon-Computational Session (1.00-5.30 PM)

- Critical analysis of Docking and Scoring
  - Breakout sessions & discussion (Parallel)
  - Selection of data sets (protein target classes and ligands for highly accurate binding affinity data measurement)
    - Experimental techniques, limitations & uncertainty in measurements
    - Docking Methodologies, is docking the right technology?
    - Scoring Functions & Force Fields, why do they fail and how are they improved

April 20th New Methods & Technologies for Exploration of Molecular Recognition Events

Breakfast 8.15-8.45AM

Morning Session (8.45-12.00 noon)

- Overview of free energy calculation methods
  - Free energy perturbations & thermodynamic integration methods
  - MMPBSA method
  - Force Field methods
  - QM methods

Lunch 12.00-1.00PM

Afternoon Session (1.00-5.30 PM)

- Solvation issues
  - Protein pKa's
  - Small molecule pKa's
  - Sensitivity analysis
  - Grid based free energy calculations

Breakout Session & Discussion
Sampling criteria: Protein, Solvent. Standards for convergence, ionization states. What errors are acceptable, trends in hardware development

Conference Dinner (Hilton Hotel 7.00 pm)

April 21st Physical Property Measurements

Breakfast 7.45-8.00AM

Morning Session (8.00-12.00 noon)

- Session Overview: Property Measurements: The value & intricacies:
  - -Tautomer Ratios
  - -ADME Properties
  - -Free Energies of Transfer
- Experimental Property Measurements at NIST
  - Discussion Panel I:(Computational Perspective)
    - -Small molecule experimental data:
      What we use, how we use it, and why we think we need more?
  - Discussion Panel II: (Experimental Perspective)
    - -Where computational chemists might find new data, caveats in interpreting existing experimental data, what methods could help get new measurements"
    - Round Table: Physical Property Measurement: what to measure and how

Lunch 12-00-1.00PM

Afternoon session (1.00-5.30PM)

- Chemical collections Session:
  - -What data sets should be selected &which physical properties measured-Straw man
    - Breakout & Discussion
  - **Proposals, Outcomes and road maps**
  - **Workshop Close (5.30PM)**

Current Speakers

Anne Chaka, (National Institute of Standards and Technology)
Christopher Bayly, (Merck-Frosst)
Wolfgan Damm (Schrodinger)
Michael Doyle, (Bristol-Myers Squibb)
Michael Gilson, (Center for Advance Research in Biotechnology-UMBI)
Peter Guthrie, (University of Western Ontario)
Martha Head, (GlaxoSmithKline)
Jan Jensen, (University of Iowa)
Rachel Kroe, (Boehringer Ingelheim Pharmaceuticals)
David Leahy, (Cyprotex)
Ray Luo, (University of California, Irvine)
Alex Mackerell, (University of Maryland)
John Marino, (National Institute of Standards and Technology)
Mark Mclinden, (National Institute of Standards and Technology)
Kenneth Merz, (University of Florida)
Anthony Nicholls, (OpenEye Scientific Software)
Benoit Roux, (University of Chicago)
Kim Sharp, (University of Pennsylvania)
George Shields, (Hamilton College)
Michael Shirts, (Columbia University)
Carlos Simmerling, (Stony Brook)
Mathew Todd (Johnson & Johnson)
Peter Taylor, (Astra-Zeneca-(retired))
Mark Witmer, (Bristol-Myers Squibb)

Sponsorship provided by:

Abbott Laboratories
GlaxoSmithKline
Merck-Frosst
National Institute of Standards and Technology
National Cancer Institute
OpenEye Scientific Software

Organizing Committee

Thomas Allison, (National Institute of Standards and Technology)
Scott Brown, Abbott Labs)
Christopher Bayly, (Merck-Frosst)
Anne Chaka, (National Institute of Standards and Technology)
Jack Collins, (National Cancer Institute)
Michael Gilson, (Center for Advanced Research in Biotechnology-UMBI)
Martha Head, (GlaxoSmithKline)
Jayne Kapur, (National Institute of Standards and Technology)
Kenneth Merz, (University of Florida)
Steven Muchmore, (Abbott Labs)
S. Ravichandran, (National Cancer Institute)
Adrian Roitberg, (University of Florida)
Frederick Schwarz, (National Institute of Standards and Technology)
Simon Webb, (National Cancer Institute)